This program aggregates the Micro-grids based on the algorithm described in the BCPM2 Model documentation. For each group of aggregated Micro-grids, a record with a Wire-Center-unique aggregate grid ID and the aggregated values are output to the *aa*AGG table. Additionally, each Micro-grid is tagged with the aggregate grid ID.

Step 26: Calculate Feeder Information for Aggregate Grids

Program: DOS C-Program **B2WCFDR**
Tables/Files Used/Affected: ***basepath**aa**aa*WCSWS**, switches for state wire centers
***basepath**aa**aa*AGG**, aggregate grids
Tables/Files Produced: ***basepath**aa**aa*FNFO**, feeder information

This program calculates the feeder lengths and FDI code for each aggregate grid. The table *aa*FNFO contains main feeder-angle information for each wire center that is necessary for creating MapInfo maps for the feeders.

Step 27: Calculate (and Replace With where Appropriate) Alternate Feeder Routes

Program: DOS C-Program **B2WCFD2**
Tables/Files Used/Affected: ***basepath**aa**aa*WCSWS**, switches for state wire centers
***basepath**aa**aa*AGG**, aggregate grids
***basepath**aa**aa*FNFO**, feeder information

This program calculates the feeder lengths on an unsplit cardinal direction basis and, if this alternate feeder routing is shorter than the previous, substitutes it in the ***aa*FNFO** table.

Step 28: Generate the Primary Output CSV File

Program: MapBasic **B2OUTCSV**
Tables/Files Used/Affected: ***basepath**aa**aa*AGG**, aggregate grids
Tables/Files Produced: ***basepath**aa**aa*OUT.CSV**, primary comma-separated variables file
***basepath**aa**aa*OUTZ.CSV**, empty records of the above file

This program sorts the AGG table into FDI Code within Switch CLLI. It generates the CSV file, creating where necessary a special record to reflect the split of a main feeder at 10,000 feet.

Step 29: Generate the Wire Center Terrain Information

Program: DOS C-Program **B2WCTRN**
Tables/Files Used/Affected: ***basepath**aa**aa*WCGR**, micro-grids
Tables/Files Produced: ***basepath**aa**aa*WCTRN**, summarized terrain table

This program summarizes the terrain data from the microgrids of a WC service area. Its two command-line arguments are *StateAbbr* and *BasePath*.

Step 30: Generate the Wire Center Terrain Output CSV

Program: MapBasic **B2TRNCSV**
Tables/Files Used/Affected: ***basepath**aa**aa*WCTRN**, summarized terrain table
Tables/Files Produced: ***basepath**aa**aa*WCTRN.CSV**, comma-separated variables file

This program generates the record for each switch, in switch CLLI order, summarizing the terrain characteristics of the service area.

Step 31: Generate the Wire Center Info CSV File

Program: MapBasic **B2INFCSV**
Tables/Files Used/Affected: ***basepath**aa**aa*WCSWS**, switches in wire centers
***basepath*\TELCOS**, all telephone companies' file
Tables/Files Produced: ***basepath**aa**aa*WCINF.CSV**, comma-separated variables file

This program generates the record for each switch, in switch CLLI order, summarizing the ownership characteristics of the service area.

Postlude:

We ZIP the two files ***aa*OUT.CSV** and ***aa*OUTZ.CSV** into ***aa*OUT.ZIP**. We ZIP the two files ***aa*WCTRN.CSV** and ***aa*WCINF.CSV** into ***aa*WC.ZIP**. We then FTP these to the INDETEC FTP site.

APPENDIX B

BCPM 3.0 GRID AGGREGATION: GENERAL RULES

Terminology:

The following terms are used in the grid aggregation rules:

Grid	=	1/25 degree Latitude/Longitude Grid
1/4Grid	=	1/50 degree Latitude/Longitude Grid
1/16Grid	=	1/100 degree Latitude/Longitude Grid
1/64Grid	=	1/200 degree Latitude/Longitude Grid

General Rules

If any grid has <1000 Household Units (HU) then output;

Of remaining data,
If any 1/64 grid > 400 HU then do:
- If Grid - 1/64 grid < 400 HU then Output Grid;
- Else If 1/4Grid - 1/64 grid < 400 HU then Output 1/4Grid;
- Else If 1/16 Grid - 1/64 grid < 400 HU then Output 1/16Grid;
- Else Output 1/64Grids (all 4);

Of remaining data
If any 1/16 grid > 400 HU then do:
- If Grid - 1/16 grid < 400 HU then Output Grid;
- Else If 1/4Grid - 1/16 grid < 400 HU then Output 1/4Grid;
- Else Output 1/16Grids (remaining 4);

Of remaining data
If any 1/4 grid > 400 HU then do:
- If Grid - 1/4 grid < 400 HU then Output Grid;
- Else Output 1/4Grids (Remaining 4);

Clean up

If any record has < 100 then Merge with horizontal or vertical similar Grid of equal or larger size to which the road centroid leans.
Partial grids less than 1/5 of a large grid will be aggregated back in (as long as line count is less than 100) to the grid along the longest edge.

APPENDIX B

BCPM 3.0 GRID AGGREGATION: GENERAL RULES

Terminology:

The following terms are used in the grid aggregation rules:

Grid	=	1/25 degree Latitude/Longitude Grid
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General Rules

If any grid has <1000 Household Units (HU) then output;

Of remaining data,
If any 1/64 grid > 400 HU then do:
- If Grid - 1/64 grid < 400 HU then Output Grid;
- Else If 1/4Grid - 1/64 grid < 400 HU then Output 1/4Grid;
- Else If 1/16 Grid - 1/64 grid < 400 HU then Output 1/16Grid;
- Else Output 1/64Grids (all 4);

Of remaining data
If any 1/16 grid > 400 HU then do:
- If Grid - 1/16 grid < 400 HU then Output Grid;
- Else If 1/4Grid - 1/16 grid < 400 HU then Output 1/4Grid;
- Else Output 1/16Grids (remaining 4);

Of remaining data
If any 1/4 grid > 400 HU then do:
- If Grid - 1/4 grid < 400 HU then Output Grid;
- Else Output 1/4Grids (Remaining 4);

Clean up

If any record has < 100 then Merge with horizontal or vertical similar Grid of equal or larger size to which the road centroid leans.
Partial grids less than 1/5 of a large grid will be aggregated back in (as long as line count is less than 100) to the grid along the longest edge.

Benchmark Cost Proxy Model
Release 3.0

Model Inputs

December 11, 1997 Edition

Developed by
BellSouth, *INDETEC* International,
Sprint and U S WEST

Preface

The intent of this document is to discuss the definition, value, source and rationale for the individual inputs for BCPM 3.0. This edition includes information on the switching module inputs. Descriptions of inputs associated with the other modules contained in BCPM 3.0 is under development and will be included in future edition of Model Inputs.

A more general discussion of the inputs for the other modules of BCPM 3.0 can be found in the BCPM 3.0 Model Methodology.

SWITCH MODEL INPUTS
Contents

1 State Default Table

This table contains inputs that can reasonably be made specific to the state and company level. The input values supplied with BCPM 3.0 represent what the sponsors consider to be reasonable representative values for these inputs. The defaults are provided for the convenience of users who may not have access to more specific data. Some are based upon observations and the judgement of BCPM subject matter experts. The BCPM Sponsors do not represent the provided values as necessarily appropriate for every potential serving area. Many of the inputs have a wide range of valid values. We recommend that the user replace these values with state and company specific inputs whenever available. Several of these inputs are state defaults to be used when CLLI-specific data has not been provided via the Switch-Specific Data Table.

1.1 State

1.1.1 Definition

The state to which the inputs pertain.

1.1.2 Typical Input Value

Not Applicable.

1.1.3 Source

Postal abbreviations for states and territories.

1.1.4 Rationale

Allows data to be provided on a state-specific basis.

1.2 ARMIS Percent Local Calls

1.2.1 Definition

Percent of calls that are local (intra-switch and inter-switch). Includes Extended Area Service (EAS) calling.

1.2.2 Typical Input Value

ARMIS Percent Local Calls
81.5%

1.2.3 Source

Derived from ARMIS Report 43-08, Number of Local Calls / Total Calls. The values supplied with BCPM are state-specific.

1.2.4 Rationale

The percent local calls is used along with a number of local calls per line to develop an engineered number of calls per line for use in switch investment estimation. This typical value represents the average of all states.

1.3 ARMIS Percent Toll Calls

1.3.1 Definition

Percent of calls that are IntraLATA and InterLATA toll.

1.3.2 Typical Input Value

ARMIS Percent Toll Calls
18.5%

1.3.3 Source

Derived from ARMIS Report 43-08, (Number of IntraLATA toll calls plus InterLATA toll calls) / Total Calls. The values supplied with BCPM are state-specific.

1.3.4 Rationale

The percent toll calls is used along with a number of toll calls per line to develop an engineered number of calls per line for use in switch investment estimation. This typical value represents the average of all states.

1.4 ARMIS Percent Residence Lines

1.4.1 Definition

This is the percentage of switched local exchange lines that are residential.

1.4.2 Typical Input Value

Percent Residence Lines
67.4%

1.4.3 Source

Derived from ARMIS 43-08 results. The values supplied with BCPM are state-specific.

1.4.4 Rationale

This input is used to develop the engineered busy hour calls and CCS per line when the user opts to develop those parameters from direct input of calls and minutes. It is also used to develop customer calling characteristics that are used to determine the percent of usage investment that is attributable to USF. This typical value represents the average of all states.

1.5 Percent Business Lines

1.5.1 Definition

This is the percentage of switched local exchange lines that are business (single- and multi-line).

1.5.2 Typical Input Value

Percent Business Lines
32.6%

1.5.3 Source

Derived from ARMIS 43-08 results. The values supplied with BCPM are state-specific.

1.5.4 Rationale

This input is used to develop the engineered busy hour calls and CCS per line when the user opts to develop those parameters from direct input of calls and minutes. It is also used to develop customer calling characteristics that are used to determine the percent of usage investment that is attributable to USF. This typical value represents the average of all states.

1.6 Default Engineered Calls per Line

1.6.1 Definition

This is the number of Busy Hour calls per line used to engineer switches. This input is used to estimate total switch investments if the user opts not to develop this value by inputting assumptions about the number of calls and minutes per line. If the user has provided CLLI-specific inputs via the User Data table, then those will be used instead of this default.

1.6.2 Default Input Value

Default Engineered Calls per Line
2.5

1.6.3 Source

This input should be obtained from switch engineering experts for the company under study, if possible. The default input value represents the judgement and experience of BCPM sponsor company subject matter experts.

1.6.4 Rationale

This input was chosen to be consistent with the engineering data used to price switches and as input to Audited LEC Switch Models (ALSMs). A round number was selected to protect the confidentiality of the actual data. Typically, switches are engineered to a single traffic input such as this, rather than discrete estimates of residential and business usage.

1.7 Default Engineered CCS per Line

1.7.1 Definition

This is the number of Busy Hour CCS per line used to engineer switches. This input is used to estimate total switch investments if the user opts not to develop this value by inputting assumptions about the number of calls and minutes per line. If the user has provided CLLI-specific inputs via the User Data table, then those will be used instead of this default.

1.7.2 Default Input Value

Default Engineered CCS per Line
3.6

1.7.3 Source

This input should be obtained from switch engineering experts for the company under study, if possible. This input represents the judgement and experience of BCPM sponsor company subject matter experts.

1.7.4 Rationale

This input was chosen to be consistent with the engineering data used to price switches and as input to Audited LEC Switch Models (ALSMs). A round number was selected to protect the confidentiality of the actual data. Typically, switches are engineered to a single traffic input such as this, rather than discrete estimates of residential and business usage.

1.8 Number of Busy Hour Local/EAS Calls per Residence Line (Optional)

1.8.1 Definition

This is the number of Busy Hour residence calls per line (Local and Extended Area Service) to be designated as Universal Service usage. This input is used to determine the portion of total usage investment attributable to Universal Service and to estimate the total office switching investment when the user opts to use this input method.

1.8.2 Suggested Input Value

Number of Busy Hour Local/EAS Calls per Residence Line
2.0

1.8.3 Source

We recommend that the user request wire-center specific studies to obtain this data if possible. Telco engineering departments may have switch engineering data that could be used. The value supplied here was chosen to be consistent with the engineering data supplied for input 1.6.

1.8.4 Rationale

The BCPM Sponsors believe that engineering data provides the most reliable source for this input.

1.9 Number of Busy Hour Local/EAS Calls per Business Line (Optional)

1.9.1 Definition

This is the number of Busy Hour business calls per line (Local and Extended Area Service) to be designated as Universal Service usage. This input is used to determine the portion of total usage investment attributable to Universal Service and to estimate the total office switching investment when the user opts to use this input method.

1.9.2 Suggested Input Value

Number of Busy Hour Local/EAS Calls per Business Line
2.0

1.9.3 Source

We recommend that the user request wire-center specific studies to obtain this data if possible. Telco engineering departments may have switch engineering data that could be

used. The value supplied here was chosen to be consistent with the engineering data supplied for input 1.6.

1.9.4 Rationale

The BCPM Sponsors believe that engineering data provides the most reliable source for this input.

1.10 Number of Busy Hour Toll Calls per Residence Line (Optional)

1.10.1 Definition

This is the number of Busy Hour residence calls per line (IntraLATA Toll and InterLATA Toll). This input is used to determine the portion of total usage investment attributable to Universal Service and to estimate the total office switching investment when the user opts to use this input method.

1.10.2 Suggested Input Value

Number of Busy Hour Toll Calls per Residence Line
0.5

1.10.3 Source

We recommend that the user request wire-center specific studies to obtain this data if possible. Telco engineering departments may have switch engineering data that could be used. The value supplied here was chosen to be consistent with the engineering data supplied for input 1.6.

1.10.4 Rationale

The BCPM Sponsors believe that engineering data provides the most reliable source for this input.

1.11 Number of Busy Hour Toll Calls per Business Line (Optional)

1.11.1 Definition

This is the number of Busy Hour business calls per line (IntraLATA Toll and InterLATA Toll). This input is used to determine the portion of total usage investment attributable to Universal Service and to estimate the total office switching investment when the user opts to use this input method.

1.11.2 Suggested Input Value

Number of Busy Hour Toll Calls per Business Line

0.5

1.11.3 Source

We recommend that the user request wire-center specific studies to obtain this data if possible. Telco engineering departments may have switch engineering data that could be used. The value supplied here was chosen to be consistent with the engineering data supplied for input 1.6.

1.11.4 Rationale

The BCPM Sponsors believe that engineering data provides the most reliable source for this input.

1.12 Number of Local/EAS Minutes per Call per Residence Line (Optional)

1.12.1 Definition

This is the number of Minutes per residence call (Local and Extended Area Service). This input is used to determine the portion of total usage investment attributable to Universal Service and to estimate the total office switching investment when the user opts to use this input method.

1.12.2 Suggested Input Value

Number of Local/EAS Minutes per Call per Residence Line
2.5

1.12.3 Source

We recommend that the user request wire-center specific studies to obtain this data if possible. Telco engineering departments may have switch engineering data that could be used. The value supplied here was chosen to be consistent with the engineering data supplied for input 1.7.

1.12.4 Rationale

The BCPM Sponsors believe that engineering data provides the most reliable source for this input.

1.13 Number of Local/EAS Minutes per Call per Business Line (Optional)

1.13.1 Definition

This is the number of Busy Hour Minutes per business call (Local and Extended Area Service). This input is used to determine the portion of total usage investment attributable

to Universal Service and to estimate the total office switching investment when the user opts to use this input method.

1.13.2 Suggested Input Value

Number of Local/EAS Minutes per Call per Business Line
2.5

1.13.3 Source

We recommend that the user request wire-center specific studies to obtain this data if possible. Telco engineering departments may have switch engineering data that could be used. The value supplied here was chosen to be consistent with the engineering data supplied for input 1.7.

1.13.4 Rationale

The BCPM Sponsors believe that engineering data provides the most reliable source for this input.

1.14 Number of Toll Minutes per Call per Residence Line (Optional)

1.14.1 Definition

This is the number of Busy Hour Minutes per residence call (InterLATA Toll and IntraLATA Toll). This input is used to determine the portion of total usage investment attributable to Universal Service and to estimate the total office switching investment when the user opts to use this input method.

1.14.2 Suggested Input Value

Number of Toll Minutes per Call per Residence Line
2.5

1.14.3 Source

We recommend that the user request wire-center specific studies to obtain this data if possible. Telco engineering departments may have switch engineering data that could be used. The value supplied here was chosen to be consistent with the engineering data supplied for input 1.7.

1.14.4 Rationale

The BCPM Sponsors believe that engineering data provides the most reliable source for this input.

1.15 Number of Toll Minutes per Call per Business Line (Optional)

1.15.1 Definition

This is the number of Busy Hour Minutes per business call (InterLATA Toll and IntraLATA Toll). This input is used to determine the portion of total usage investment attributable to Universal Service and to estimate the total office switching investment when the user opts to use this input method.

1.15.2 Suggested Input Value

Number of Toll Minutes per Call per Business Line
2.5

1.15.3 Source

We recommend that the user request wire-center specific studies to obtain this data if possible. Telco engineering departments may have switch engineering data that could be used. The value supplied here was chosen to be consistent with the engineering data supplied for input 1.7.

1.15.4 Rationale

The BCPM Sponsors believe that engineering data provides the most reliable source for this input.

1.16 Land Loading

1.16.1 Definition

The ratio of land investment to central office investment.

1.16.2 Default Input Value

Land Loading
0.0117

1.16.3 Source

The land ratio is based upon the 1995 ARMIS values of Land divided by the sum of COE (Switching, Operator and Transmission).

1.16.4 Rationale

Application of this ratio produces an investment in land needed to place the central office. The investment function is:

*Land investment = Land Loading * Switch Investment*

1.17 Building Loading

1.17.1 Definition

The ratio of building investment to central office investment.

1.17.2 Default Input Value

Building Loading
0.0738

1.17.3 Source

The Building factor was based upon a LEC Industry data request (the actual data value was a land and building factor, the ARMIS land factor was subtracted to arrive at the building factor).

1.17.4 Rationale

Application of this ratio produces an investment in land needed to place the central office. The investment function is:

*Building investment = Building Loading * Switch Investment*

1.18 Telco E&I Factor

1.18.1 Definition

The ratio of telephone company capitalized engineering and installation dollars to switch investment dollars.

1.18.2 Default Input Value

Telco E&I Factor
0.0577

1.18.2 Source

The default input is taken from BCPM 1.1. We strongly recommend that users develop inputs specific to the local company under study. Data for this calculation should be available from the accounting records of the company.

1.18.3 Rationale

The Telco E&I factor is needed to calculate the investment for telephone company capitalized engineering expenses. The investment function is:

*Telco E&I Investment = Telco E&I Loading * Vendor EF&I Switch Investment*

1.19 Common Equipment & Power Factor

1.19.1 Definition

The ratio of central office common equipment and powerplant investment to switch dollars.

1.19.2 Default Input Value

Common Equipment & Power Factor
0.0682

1.19.2 Source

The default input is taken from BCPM 1.1. We strongly recommend that users develop inputs specific to the local company under study. Data for this calculation should be available from the accounting records of the company.

1.19.3 Rationale

The CE&P factor is needed to calculate the investment for telephone company capitalized engineering expenses. The investment function is:

*CE&P Investment = CE&P Loading * EF&I Switch Investment*